

Towards quantitative magnetic measurements with sub-nanometer lateral resolution

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X-ray magnetic circular dichroism (XMCD) is a well established technique for measurement of magnetic properties. By measuring x-ray absorption spectra with circularly polarized x-rays the values of spin and orbital magnetic moments can be extracted using sum rules. Due to difficulties to focus x-rays to small spots, the spatial resolution of XMCD-based techniques remains around 10nm [1]. Since 2016 a transmission electron microscopy analogue of XMCD is under intense development. The technique named electron magnetic circular dichroism (EMCD; [2]) should in principle allow to measure magnetic moments with atomic lateral spatial resolution. We will review the present state of the art in EMCD, particularly focusing on recent advances in EMCD measurements with atomic size electron beams [3,4,5].

References:

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